The Evolving Fuze
or
When a Fuze is not just a Fuze

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DELIVERING FUZE SAFETY

NATO SAFETY STANDARDS

AC310 Sub Group 2

FUZES

SAFETY
THE GENERAL BUSINESS CASE

- OBVIOUS - ENVIRONMENTAL AND PUBLIC PRESSURE
- POLITICAL WILL (eg LANDMINES)
- LEGISLATION - UK HSWA 1974 s6(1)
- LITIGATION

SAFETY
THE DEFENCE BUSINESS CASE

- CONFIDENCE IN EQUIPMENT
- PROTECT OUR SERVICE PERSONNEL
- STANDARD SAFETY TESTING
- INTERNATIONAL COMPATIBILITY
- OFF THE SHELF PROCUREMENT

NATO International Safety Standards

STANAG 4187

Fuzing Systems - Safety Design Requirements

AOP 16

Fuzing Systems - Guidelines for STANAG 4187

AOP 42

Integrated Design Analysis for Munition Initiation Systems and other Safety Critical Systems

Definitions

Fuzing System (STANAG 4187)

A system designed to:

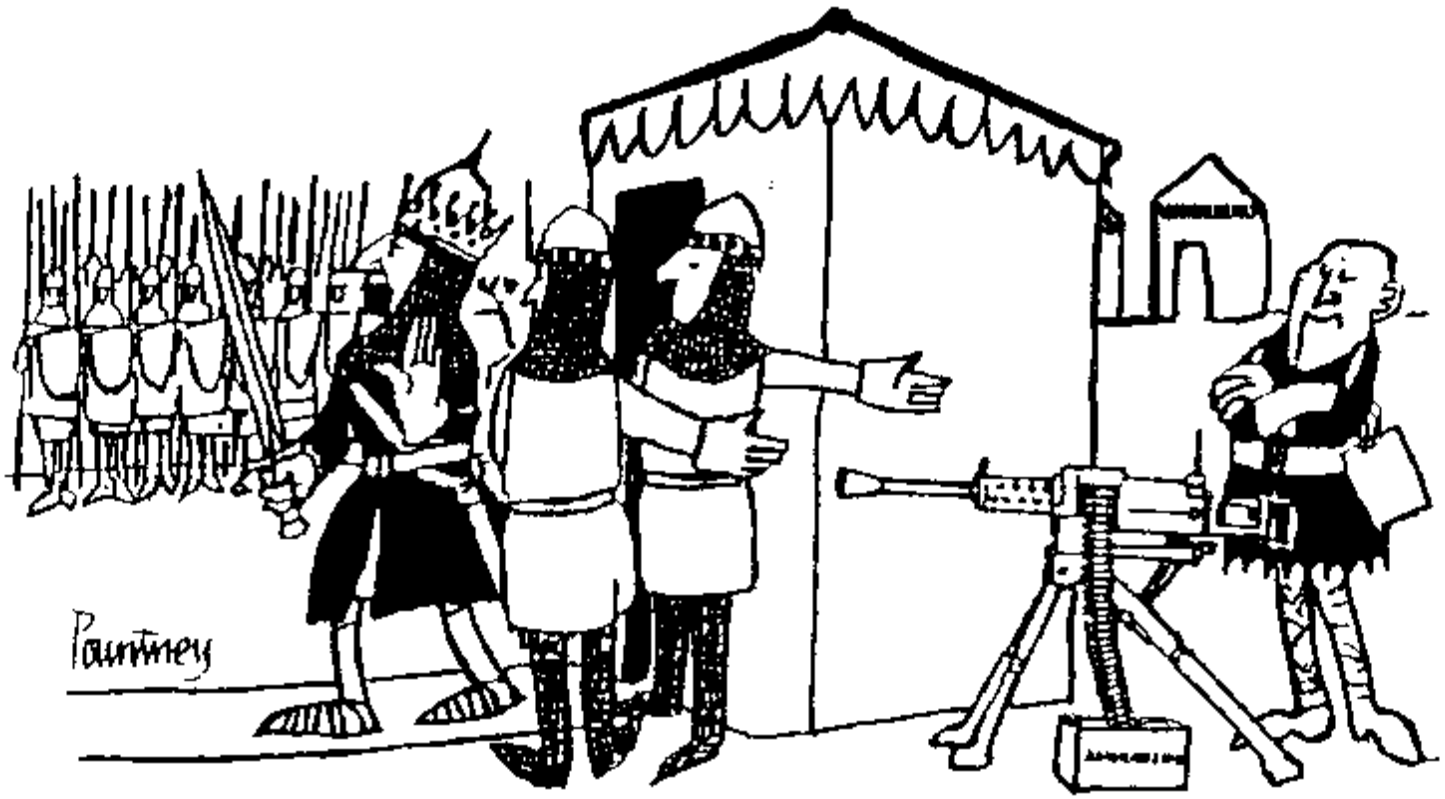
- Provide as a primary role safety and arming functions in order to preclude munition arming before the desired position and time
- Sense a target or respond to one or more prescribed conditions, such as elapsed time, pressure or command
- Initiate an explosive train in a munition

FUNDAMENTAL SAFETY DESIGN REQUIREMENTS - STANAG 4187

9.1.1 Fuzing systems shall include at least two safety features, the operation of which are, wherever possible, functionally isolated from other processes within the munition system ...

Processes which may use but are not considered part of Fuzing systems in normal operation

- Course Correction
- Flight Termination*
- Remote Control (sensor)
- Anti - Dud
  - (Unexploded Munition = Landmine)
- Demilitarisation/Disposal*
- ?



Tell him that unless it complies with STANAG 4187
I don't care how good it is!

Some Principles

- Must not compromise intrinsic safety
- Add-ons should be independent
- Novel solutions considered - supported by Design Analysis
- Use STANAG 4187, AOP 16 & 42
  - ➔ National Safety Approving Authority

Concept Approval - Recommendations

- Hazard Analysis
- Fault Tree Analysis
- Design Logic
- Integrated Design Analysis (AOP 42)

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Any Questions?